PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS IN INTERTILE WOMEN

Dissertation submitted for

M.D. BRANCH - II

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DECLARATION

I, **Dr. J. SAKTHI USHA DEVI**, solemnly declare that dissertation titled, **"PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS IN INFERTILE WOMEN"** is a bonafide work done by me at Govt. Stanley Medical College & Hospital during 2006-2008 under the guidance and supervision of my Unit Chief **Prof. Dr. SASIREKHA, M.D., D.G.O.**

The dissertation is submitted to Tamilnadu, Dr. M.G.R. Medical University, towards partial fulfillment of requirement for the award of M.D. Degree (Branch –II) in Obstetrics and Gynecology.

Place : Chennai.

Date : (**Dr. J. SAKTHI USHA DEVI)**

CERTIFICATE

This is to certify that the dissertation entitled **"PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS IN INFERTILE WOMEN"** is the bonafide original work of **Dr. J. SAKTHI USHA DEVI** in partial fulfillment of the requirement of the Tamilnadu Dr. M.G.R. Medical University to be held in March 2008. The period of study was from July 2006 to June 2007.

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PROFORMA FOR PREVALENCE OF SEXUALLY TRANSMITTED DISEASES IN INFERTILE WOMEN

Name

Age O.P. No

Occupation Socioeconomic status

Address

Duration of married life yrs. mths

Presenting complaints – anxious to conceive

Irregular menstrual cycle yes no

Vaginal discharge nil yes

Duration <3 mths >3 mths

Quality mucoid mucopurulent blood stained

Quality scanty profuse

Foul smeeling yes no

Itching yes no

Genital ulcer yes no

Burning micturition yes no

Lower abdominal pain yes no

Monogamous for past 3 months yes no

Extramarital contact

Premarital contact

Contraception yes ☐ no

Barrier

Non-barrier

Frequency of coitus per week ☐ <3 ☐ >3

Past history of STD / PID & treatment received

History of other illnesses T.B,D.M,H.T, Hypothyroidism

Family history of infertility

Previous obstetric history – Spontaneous abortion

Still birth

Neonatal death

Clinical examination :

Breast

Inguinal lymphadenopathy

Per abdomen ☐ tenderness ☐ mass

External genitalia

Per speculu – Vaginal secretions

Cervix

Per vagina

Investigations

Hb TC ESR

PCV DC

Urine – Albumin ☐ sugar deposits ☐

Wet film for Trichomonas

KOH mount for candida

Culture for candida

Gram stain for ☐ candida ☐ clue cells ☐ gonococcus

Endocervical culture for gonococcus

Chlamydia antigen detection test

Chlamydia IgM antibody ELISA test

VDRL

1. INTRODUCTION

Epidemiology of STI

In many developing countries through out the world Sexually Transmitted Infections rank among the top 5 conditions for which adults seek health care (WHO/UNAID). Especially in women of child bearing age. Sexually Transmitted Infections are second only to maternal factors as a cause of disease death & healthy life lost.

Sexually Transmitted diseases (STD's) are an important cause of morbidity and mortality worldwide especially in women and children and more particularly in the poor resource setting of the developing world.

These diseases are important for two reasons

1. Their magnitude
2. Their potential for causing serious complications.

STIs Global Face

WHO estimated that 340 million new cases of syphilis, chlamydia and trichomoniasis have occurred throughout the world in 1999 in men & women aged 15-49 years of age.

STI in India

An overview

- It is estimated that STI prevalence in Urban areas will be
  10% - High Prevalent states
  7% - Medium Prevalent states
  5% - Low Prevalent states

Same for Male & Female

Rural – 5%

Source – NACO – Publication – combating HIV / AIDS in India – 2000 – 01)

- Prevalence of classical STIs in Tamilnadu as per the study conducted by APAC in 2004 – 10.6% in the age group of 15 – 45 yrs.

Sexually transmitted infections have implications which are rather serious in women than in men.

The symptoms and sequale of STI vary from men & women and the latter experience a greater psychological stress.

Asymptomatic STI are more frequent in women. Very often, the disease presents in a concealed site, not visible outside. Moreover the most common symptom of STI in the women namely the discharge is exhibited by many non STI and masks – early recognition of STI in such women and so there is delay in seeking treatment or is not treated at all.

The long term complications of STI are far more serious in women than in men. The important complications are risk of cancer, infertility, miscarriage, still birth and risk of ectopic pregnancy and inadvertent transmission of perinatal infection.

Infertility is defined as one year of unprotected intercourse without pregnancy. This condition may be further classified as primary infertility in which no previous pregnancy has occurred, and secondary infertility in which previous pregnancy has occurred.

Infertility affects about 10-15% of the couple in reproductive age group. Tubal factors causing infertility is 30-40%.

The risk for infertility after a single bout of PID is surprisingly high and increased rapidly with subsequent episodes. In fact the incidence of tubal infertility has been reported to be 12% ; 23% & 54% after one two (or) three episodes of PID respectively.

Most of these women are presumed to have had subclincial chlamydial infections.

Lower genital tract infections that ascend into the upper genital tract (IUD's cause four fold increase in PID) can produce inflammation and scarring that decreases the chance of intratubal fertilization.

Hence screening of STDs and partner notification should be done in all infertile women.

2. AIM OF THE STUDY

To determine the prevalence of sexually transmitted diseases among infertile women attending the infertility clinic in Raja Sir Ramasamy Mudaliar Lying-in Hospital, Govt. Stanley Medical College – Chennai and therefore determine which infections had higher prevalence so that cost effective screening and strategies for primary prevention could be incorporated to prevent PID and therefore PID associated infertility.

3. REVIEW OF LITERATURE

SEXUALLY TRANSMITTED INFECTIONS

CHLAMYDIA TRACHOMATIS

Most common sexually transmitted disease in women of reproductive age. Chlamydia trachomatis was first visualized by Halberstaedter and Prowazek in 1907 in stained conjuctival scraping taken from Orangutans that have been inoculated with human trachoma materials. They quickly identified the typical intra cytoplasmic inclusions, but initially assumed that the organisms belonged to protozoa. The first isolates of Chlamydia from the genital tract was made in 1959 by Collier and Smith from the cervix of the mother of an infant with “Ophthalmia neonatorum”.

It is a slow growing intracellular organism. Its lack of mitochondria results in the obligatory intracellular existence and also causes its growth cycles extremely slow compared to C N.gonorrhea and non intracellular microorganism.

The growth cycle of chlamydia is 48-72hrs therefore, several weeks to months required for growth to reach numbers sufficient to cause acute symptoms. Its slow growth does not induce violent inflammatory response. This explains low and insidious nature of symptoms of acute C.trachomatis infection. However intra cellular growth and release of elementary bodies occur by rupture of the cell it has

invaded. The repeated occurrence of elementary body infection of susceptable cells and their subsequant destruction by rupture is the major mechanism by which c.trachomatis causes disease in acute pelvic infection. Also because of its slow growth and lack of acute inflammatory response and clinical symptoms treatment is often delayed or not started at all.

The lack of acute symptoms doesnot lessen the importance of chlamydia, as a PID pathogen. Tissue destruction results in ectopic pregnancy & infertility.

The cervix and urethra are commonly involved. Infection is asymptomatic in about 80% of the patients. In other it is associated with vaginal discharge / dysuria. Postcoital, or intermenstuat bleeding may suggest PID. Examinations may reveal mucopurulent cervicitis, contact bleeding form cervix. Evidence of PID may not be present. Without treatment complications develop with the risk of tubal damage resulting in subsequent infertility or ectopic pregnancy.

Among women in the reproductive age group, risk factors for Chlamydia infection include :

1. Age below 25 yrs
2. Use of intrauterine devices and non use of barrier contraception
3. Coital frequency

4. Sex with multiple partners
5. Vaginal douching
6. Surgical procedures like dilatation and curettage, hystero salpingography and IUD insertion.
7. Presence of mucopurulent endocervicitis, cervical erythema and friability.
8. Partner with non gonococcal urethritis
9. Presence of other STDs
10. Alcohol, cigarette smoking and illicit drug use
11. Resident of socially disadvantaged community

DIAGNOSIS OF CHLAMYDIA INFECTION

1. Cell Culture System
2. Smear examination
    a. Conventional gram stain
    b. Micro immunofluorescence
3. Serology
4. DNA hybridization
5. Nucleic acid amplification

CULTURE

Being an obligate intracellular pathogen, Chlamydia trachomatis requires a cell culture system for propagation in the laboratory, therefore culture in cycloheximide – treated McCoy cells has been the gold standard test for detection of Chlamydia for many years.

DIRECT IMMUNO FLUORESCENCE TEST

This test is used to detect the chlamydial antigen by adding fluorescent labeled monoclonal antibody. When done by an experienced technician it has a sensitivity of 80-85% but overall sensitivity depends on both the experience of the person performing the test and collection of adequate specimens.

NUCLEIC ACID HYBRIDIZATION (Geneprobe Test)

This test detects but does not amplify chlamydial nucleic acid. Performance characteristics on specimens are comparable to that of direct fluorescent antibody assay and enzyme immunosorbent assays. Sensitivity. Ranges between 72.9% and 95.8%, specificity between 97.6% to 99.9%.

SEROLOGICAL METHODS

These have not been widely used for the diagnosis of Chlamydia trachomatis. First the baseline prevalence of antibody in populations of sexually active persons who are at risk for Chlamydia trachomatis infection is high, often

ranging form 45-65% of person tested. The high prevalence of sero-positivity in culture negative, asymptomatic patients presumably reflects either previous infection or persistence of chronic asymptomatic infection not easily detected with current culture technique.

Second, the lack of an abrupt onset of symptoms in many Chlamydia infected patients means that patients are seen often during periods when IgM antibody is rising and falling titres of IgM antibody cannot be demonstrated and hence these serologic parameters of recently acquired infection often are absent. This particularly applies to women as compared to men.

Third, the superficial genital tract infection (urethritis, cervicitis) generally produce micro IF antibody titres in the range of 1:8 to 1:256, but rarely higher. Higher antibody titres are more often seen in women with salpingitis and still higher titres in women with perihepatitis.

Finally, cross reacting antibodies arising due to Chlamydia pneumonia may confuse the diagnosis serologically.

GONORRHOEA

Gonorrhoea is caused by infection with Neisseria Gonorrhoea which may involve, columar epithelium in the lower genital tract and rectum. In addition, urethra, para urethral gland, duct and endocervical canal may be involved.

50% of the cases – asymptomatic 50% - Vaginal discharge / dysuria may be associated with other symptoms. Clinical examination may show no abnormality or pus may be expressed from the urethra, para urethral duct or Bartholin duct.

The cervix may be inflammed with MPC & Contact bleeding.

Gonorrhoea is associated with highest concentration of HIV-1 in semen. Gonococcal urethritis increases the infectiousness of men with HIV-1 infection. Prevalence rate of the disease is 12.2% in Delhi.

Gonococcus from culture are identified by gram stain, oxidase test, fluorescent antibody test. Culture is the most reliable method for diagnosis.

Individuals with gonorrhoea are at increased risk (approximately 40%) for chlamydial infection although reverse is not true. Latent chlamydial infections are reactivated in presence of gonorrhoea.

BACTERIAL VAGINOSIS

It is an alternation of normal bacterial vaginal flora, that result in the loss of H2O2 producing lactobacilli and over growth of predominantly anaerobic bacteria.

It is not known what triggers the disturbance of normal vaginal flora. It has been postulated that repeated alkalinisation of the vagina which acquires with frequent sexual intercourse (or) uses of douches plays a role. After normal H2 O2

producing lactobacilli disappear, it is difficult to reestablish normal vaginal flora and recurrence of BV is common. Numerous studies have shown an association of BV with adverse sequale. Women with BV are of increased risk for PID and PROM and Post Cesarean endrometritis.

Diagnosis of bacterial vaginosis is based on the following findings.

1. A fishy odour which is particularly noticeable following coitus and vaginal discharge are present.
2. Vaginal secretions are grey and thinly coat the vaginal walls Patient's vaginal PH is 7.45.
3. In advanced cases of BV more than 20% of the epithelial cells are clue cells.

Prevalences of between 4.9% to 36% have been reported from European and American studies. Risk factors are smoking douching, multiple sex partners and intrauterine contraceptive users.

Mycoplasma hominis has been found to cause slowing of mucociliary wave. They may interfere with transmission of spermatozoa in fertilization of ova directly. Antibodies to mycolplasma hominis occurred three times more often in women with tubal infertility.

In another study by Wilson et al., one third of women with tubal factor infertility had bacterial vaginosis. Endometrial infection preceded ascending infection of the fallopian tubes. Korn et al., found plasma cell endometritis to be more frequently present in women with bacterial vaginosis.

Mycoplasma genitalium infected women transmit HIV three times more often to their partners than other women. The increased frequency of HIV-1 associated with abnormal flora among younger women suggests that loss of lactobacilli or presence of bacterial vaginosis may increase susceptibility to HIV infection.

Early detection (clue cells on wet mount; and gram stain of vaginal secretion) and systemic antimicrobial therapy for bacterial vaginosis is necessary to prevent complications.

TRICHOMONAL VAGINITIS

Trichomonal vaginitis is caused by the sexually transmitted flagellated parasite – Trichomonas vaginalis. The transmission rate is high. 70% males contract the disease after single exposure to an infected female.

The parasite is an anerobe and has the ability to generate hydrogen to combine with oxygen to create an anerobic environment. It exists only in

hypophilic form Trichomonas vaginalis often accompany Bacterial vaginosis which can be diagnosed upto 60% Trichomonas vaginalis.

Local immune factors and inoculum size influence the appearance of symptoms .

Symptoms and signs may be much milder in patients with a smaller inoculation of Trichomonas vaginalis and is often asymptomatic.

1. Trichomonas vaginalis is associated with profuse, purulent, malodourous discharge that may be accompanied by vulvar prutits.
2. Vaginal secretion may exude from the vagina
3. In patients with high concentration of organism a pachy vaginal erythema and straw berry cervix may be observed
4. PH of the vaginal secretion is higher than 5.
5. Microscopy of the secretion reveals motile trichomonads and increased number of leucocytes.
6. Clue cells may be present
7. Whiff test may be positive.

Women with these infections should be tested for other STIs importantly Gonorrhea chlamydia and HIV.

Speculum examination shows a friable and erythematous cervix with punctuate hemorrhages and ulceration (strawberry cervix, colpitis macularis). Male sexual partners may be asymptomatic or show evidence of urethritis, balanitis or epididymitis.

Rarely ascending infection resulting in endometritis and salpingitis can occur. Diagnosis is confirmed by the microscopic demonstration of motile trichomonads in vaginal secretions mixed with normal saline. Culture in Feinberg-Whittington or modified Diamond culture medium is more sensitive and specific.

VULVOLVAGINAL CANDIDIASIS

Candidal vaginitis is caused by candida albicans, with the anus being the source of recurrent infection of the vulva and vagina.

If is present more frequently in diabetics, pregnant women, patients on broad spectrum antibiotics, contraceptive pills and corticosteroids, Changes in the host vaginal environment are necessary before the organism induces pathologic effect.

Symptoms of candidal vaginitis include pruritus, dysuria, frequency of micturition, dyspareunia, post coital irritation and a thick curdy white vaginal discharge.

Examination reveals cheesy, thrush like plaques and diffuse erythema of the vulva and vagina with excoriations, scaling and remote satellite pustules on the labia, perineum or inner thigh.

Diagnosis of candidal vaginitis depends on the demonstration of the yeast by microscopic examination of the vaginal secretion in 10% KOH or by gram staining, culture on sabourads dextrose agar is helpful when microscopic examination proves negative.

SYPHILIS

Causative organism is Treponema pallidum which is a motile spirochete that is generally acquired by close sexual contact and transplacentally from the mother to fetus.

Both congenital and acquired syphilis have early and late stages each of which has classical clinical features.

Incubation period is 10-90 days.

Early Syphilis (WHO<2yr)

Primary Syphilis (chancre) – usually presents as a genital ulcer that is sharply demarcated, round or oval with slightly elevated edges, may be irregular

and painless. Floor is red, smooth, shining, cursty, oozing serous exudates when squeezed, with an indurated base.

Inguinal lymphnodes unilateral or bilateral, firm movable and nontender with no suppuration.

Secondary Syphilis – Occurs 4-8 weeks after chancre. Fever, malaise, lymphadenopathy, rash (trunk, palm, soles), alopecia, condylomata lata, buccal snail track ulcer etc.

Early latent syphilis – No symptoms only reactive serology.

LATE SYPHILIS (WHO>2yrs)

Late latent syphilis with no symptoms only reactive serology or gummas – "granulomas" occurring in skin, mucosa, bone, joints and rarely viscera. Cardiovascular syphilis can manifest with aortic aneurysm with or without aortic reguragitation. Neurosyphilis with tabes dorsalis may also manifest.

Diagnostic tests used for syphilis are

1. Darkfield examination (from primary and secondary lesion)

2. Nonspecific treponemal tests-VDRL. It is a useful screening test becoming positive within 3-4wks of primary infection and negative by 6 months after

treatment. It is a quantifiable test that can be used to monitor treatment efficacy. VDRL may be negative in untreated patients (50% with late stage syphilis). False positive results may occur in infectious mononucleosis hepatitis, mycoplasma infection and some protozonal infection.

3. Specific treponemal tests

   TPHA – Treponema palladium Haemagglutination assay

   FTA ABS - Fluorescent treponema antibodies absorbed test.

PID

PID is caused by micro organism, colonizing the endocervix ascending the endometrium and fallopian tubes.

Acute PID is the most common and important complication of Sexually transmitted infections S. PID is the most common serious infection in women aged 16-25yrs and the resultant morbidly exceeds that produced by all other infections.

ETIOLOGY

Polymicrobial infection is caused by organisms ascending from the vagina and cervix.

85% - Naturally occurring infection in sexually active women of reproductive age.

15% - After procedures that break the cervical mucous barrier

ORGANISMS

N. gonorrhea

- Ch. Trachomatis
- Endogenous aerobic and anaerobic
- Genital Myco plasma

RISK FACTORS

1. Age at first intercourse
2. Frequency of intercourse
3. Number of sexual partners
4. Marital status
5. Surgical procedures
    a. Endometrial biopsy
    b. IUCD
    c. Hysteroscopy
    d. HSG

CLINICAL FEATURES

1. Lower abdominal pain
2. Cervical tenderness
3. Adnexal tenderness
4. Fever
5. Cervical discharge

MINIMUM CRITERIA

1. Uterine / adnexal tenderness.
2. Cervical Motion tenderness

ROUTINE CRITERIA

1. Oral temperature >38.3^{o}C
2. Abnormal cervical vaginal muco purulent discharge.
3. ↑ ESR
4. Elevated CRP
5. Laboratory documentation of cervical infection of N.Gonorhhea or Chlamydia trachomatis.
6. Presence of WBC on Saline microscopy.

SPECIFIC CRITERIA

1. HPE evidence of endometritis on Endometrial biopsy.
2. TVS / MRI – fluid filled tubes with or without free pelvic fluid.

- Laparoscopic examination consistent with PID

Laparoscopy is the gold standard for diagnosis of PID and the correlation with clinical criteria ranges from 65% to 87%.

Women who have had previous episodes of PID may develop a tuboavarian abscess suggested by pelvic pain and tenderness with a palpable pelvic mass. All male sexual partners of patients with PID should be examined for STD and treated accordingly.

4. MATERIALS AND METHODS

NATURE OF THE STUDY

Infertile women attending infertility clinic are largely representative of the general population.

It is a cross sectional study to find out the prevalence of STD among infertile women attending the infertility clinic at Govt. Raja Sir Ramaswamy Mudaliar Lying-in-Hospital, Stanley Medical College, Chennai -1 during the study period of June 2006 to July 2007.

Prevalence data are important for directing and monitoring the impact of public health programes.

MATERIALS

Total number of 100 infertile women who attended the Raja Sir Ramaswamy Mudaliar Lying-in-Hospital Chennai -1 were included in the study.

METHODS

A well structured, pre tested proforma was prepared and used for the study. It consisted of various information including their age, socio-economic status, marital status, sexual history, previous obstetric history, apart from a detailed

clinical history. Infertile women were screened for STD and a provisional diagnosis was made. Investigations were done accordingly to confirm the diagnosis.

INVESTIGATIONS

a. Saline mount for Trichomonas Vaginalis – smear of vaginal secretion was made on a clean glass slide. One drop of normal saline was added, cover slip placed and motile trichomonas organisms were looked for under the microscope.

b. KOH mount for candida

Smear of vaginal secretion made on a clean glass side. One drop of KOH added, cover slip placed and look for pseudohyphae under the microscope.

c. Gram stain for

i. Candida – looked for gram+ve pseudohyphae

ii. Clue cells - $\geq$ 20% of vaginal squamous epithelial cells are granular in appearance with borders studied with cocco bacilli and gram negative rods.

iii. Gonococcus – gram negative intracellular cocci in pairs.

d. Endocervical culture for gonococcus – endocervical swab was transported by Amie's medium to the laboratory and then inoculated into Thayer-Martin agar. Incubated in an atmosphere of increased carbon dioxide concentration (5-10% of CO_2) colonies of gram negative cocci in pairs are seen.

e. VDRL test for syphilis – It is a slide flocculation test. 0.05ml of inactivated serum was taken in special slides with depressions. One drop of freshly prepared antigen was added with a syringe delivering 60 drops to it. The slide was rotated 180^o rotations per minute in a VDRL rotator for four minutes. Then examined under a microscope. Formation of clumps indicates that it is reactive. Serial dilutions were tested to obtain reactive titre.

Special investigations done for the study were

A. Vaginal discharge for culture of candida species in sabourands agar medium. Sabourands medium is the commonest fungal culture media used. It consists of ingredients like glucose, cycloheximide and agar. Sterile vaginal swabs were used for taking specimens. Cultures incubated at room temperature (22^o C) for 2 weeks.

Identification was based on colony appearance (creamy, white, mucoid) and the morphology of the fungus examined by microscopy. The method of identifying candida albicans was based on its ability to form germ tubes within two hours when incubated in human serum at 37 ^{o}C

B. Chlamydia antigen detection test – Endocervical smear was taken in a sterile swab after wiping the external os with a cotton swab. The sterile swab was kept inside the endocervical canal for 10 seconds and scraping were spread over the chalmyset antigen detecting Teflon coated slide. The chlamyset slide was held in one hand and the sampling swab was rolled over the 8mm circular area on the slide. This was best done after sampling, rolling one side of swab on one half of the sample well and the other side of the swab on the other half of the sample well.

The slide was allowed to dry completely in the air (until the surface has lost its glossy appearance). Then the specimen was fixed by dipping the slide in methanol in a staining jar for 5 minutes and allowed to evaporate to dryness.

Test procedure – 30 microlitre of chalamyset antigen FA test reagent was addred to fixed specimens and the slides were placed in a moist container incubated horizontally at room temperature for 15 minutes. Then the slides were rinsed by dipping it into distilled water several times and made to dry 20 microlitres of chlamyset mounting fluid was added to the specimens and a cover

slip was placed over it. Then the slides were examined under a fluorescent microscope using 400% magnification (for screening) and 1000% magnification (for verifying the findings).

C. Sero ELISA Chlamydia true IgM test – This test was intended for the determination of specific IgM antibody to Chlamydia in a single human serum sample by an Enzyme – linked immunosorbent assay (ELISA).

Chlamydia-specific IgM antibody appears to be reliable immunological marker of acute or recent infection. This test requires only a single serum specimen and result is reported in terms of presence or absence of immune IgM.

High titres of immune IgG, which compete with immune IgM for the same antigenic sites, produce false negative IgM results. Rheumatoid factor (RF) causes false positive IgM results. Therefore IgG/RF stripping of serum is essential before the IgM assay.

The test employs the L_2 serovar broadly reacting antigen of C.trachomatous. Advantages of this test are it does not require direct pathogen sampling, and is suitable for automated processing of the test procedure and reading of results.

5. OBSERVATIONS

In this study 100 infertile women were examined and the following results were obtained :

TABLE – 1

AGE DISTRIBUTION OF INFERTILE

WOMEN IN THE STUDY GROUP (n-100)

Age in years	Total no.	Percentage %
15-19 Years	4	4%
20-24 years	43	43%
25-29 years	51	51%
30-34 years	1	1%
35 years and above	1	1%

Majority of infertile, women were in the age group of 20-24 years (52%). The youngest and oldest infertile women encountered in the study were aged 17 and 37 years respectively.

AGE DISTRIBUTION OF INFERTILE WOMEN IN THE STUDY GROUP

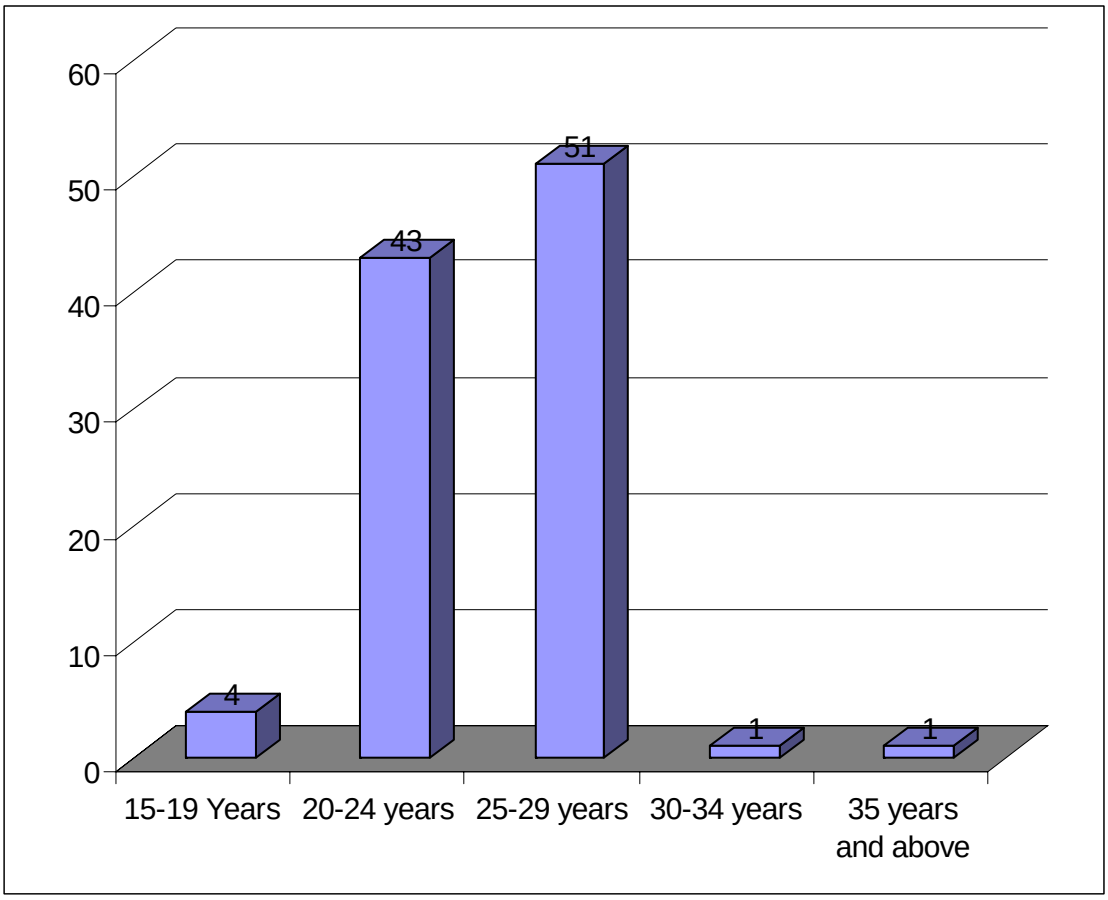

TABLE – 2

SOCIO-ECONOMIC STATUS OF INFERTILE (n-100)

WOMEN IN STUDY GROUP

Monthly Income (in Rupees)	Total no.	Percentage %
Upto 500	48	48%
500-1000	40	40%
1000-1500	6	6%
1500-2000	6	6%
Above 2000	Nil	

Majority of the infertile, women belonged to lower socio economic strata 48% ie. Income less than Rs.500.

SOCIO ECONOMIC STATUS OF INFERTILE WOMEN IN THE STUDY GROUP

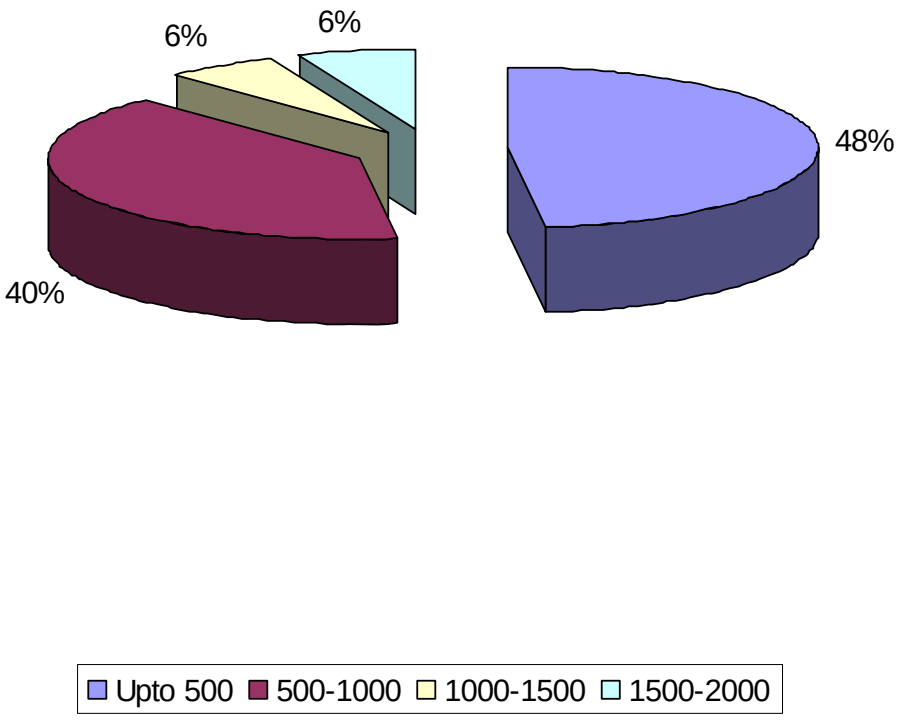

TABLE – 3

MARITAL STATUS OF THE INFERTILE WOMEN

IN THE STUDY GROUP (n-100)

No. of years of Marriage	Total No.	Percentage %
1-5 years	75	75%
6-10 years	20	20%
11-15 years	5	5%

Majority of infertile, women were married for 1-5 years (75%). The lowest and the highest duration of married life among infertile women encountered in the study group were 1 ½ years and 13 years respectively.

MARITAL STATUS OF THE INFERTILE WOMEN – NUMBER OF YEARS OF MARRIAGE

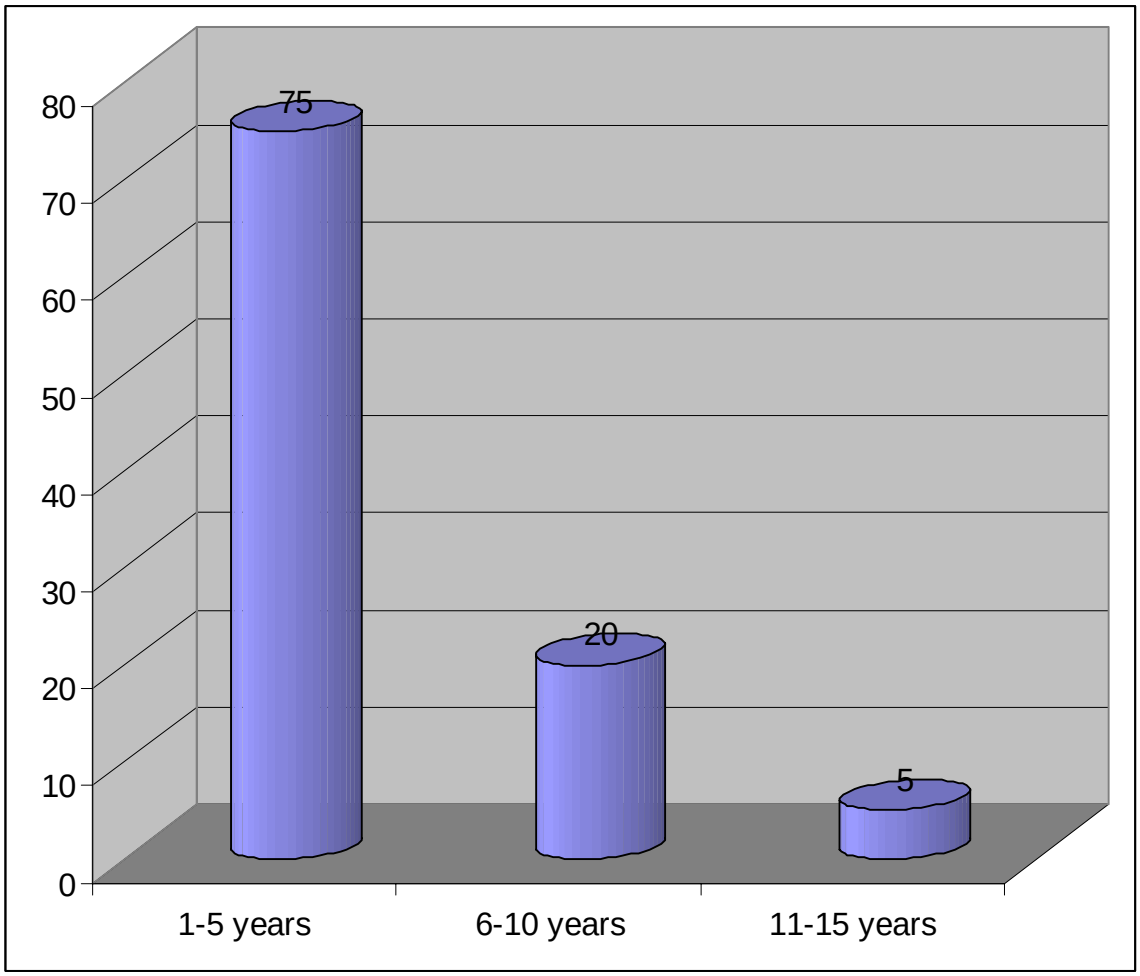

TABLE – 4

PRESENTING COMPLAINTS OF INFERTILE WOMEN (n-100)

IN THE STUDY

Complaints	Total no.
Genital Discharge	8
Irregular Periods	41
Itching of genitalia	4
Lower abdominal Pain	7
Burning micturition	1
Genital ulcer	Nil

All the 100 patients had visited the infertility clinic since they were anxious to conceive which was the main complaint.

Irregular periods was the most common presenting complaint in 41% of patients apart from infertility. 8% of patients gave a history of genital discharge

out of which 4 patients had associated itching. 7% of patients complained of lower abdominal pain. One patient had burning micturition

PRESENTING COMPLAINTS OF WOMEN IN THE STUDY

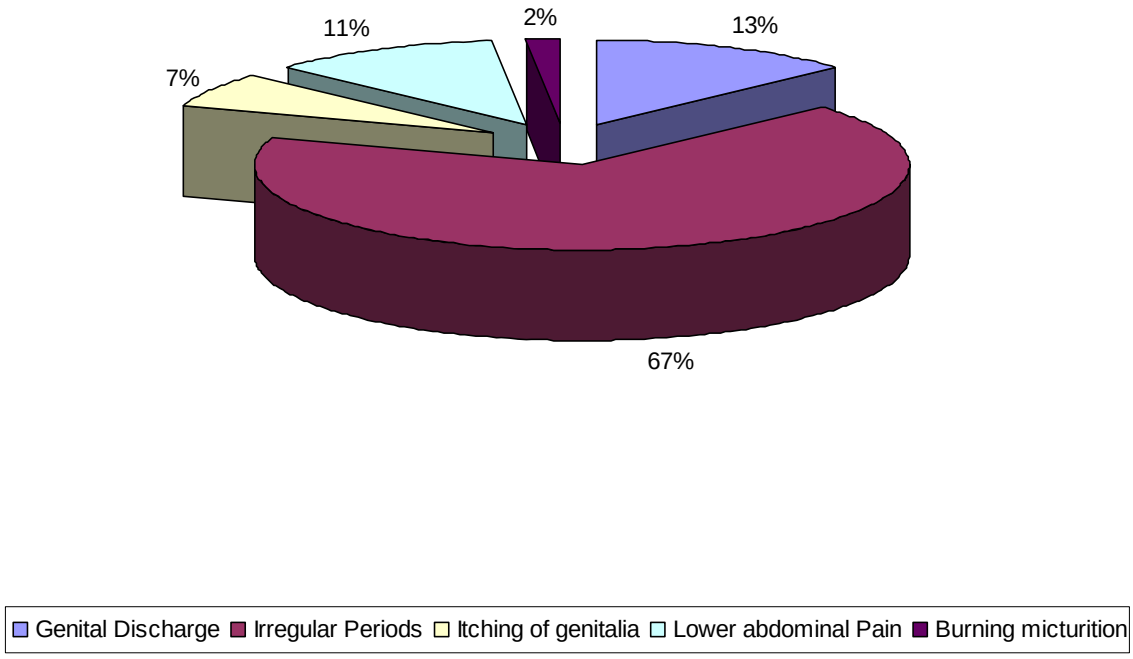

TABLE – 5

FREQUENCY OF COITUS PER WEEK

Coitus	Total no.	Percentage %
More than 3 times	74	74%
Less than 3 times	26	26%

The frequency of coitus was more than three times a week in the majority of patients (74%) showing that the majority of patients were sexually active.

FREQUENCY OF COITUS PER WEEK

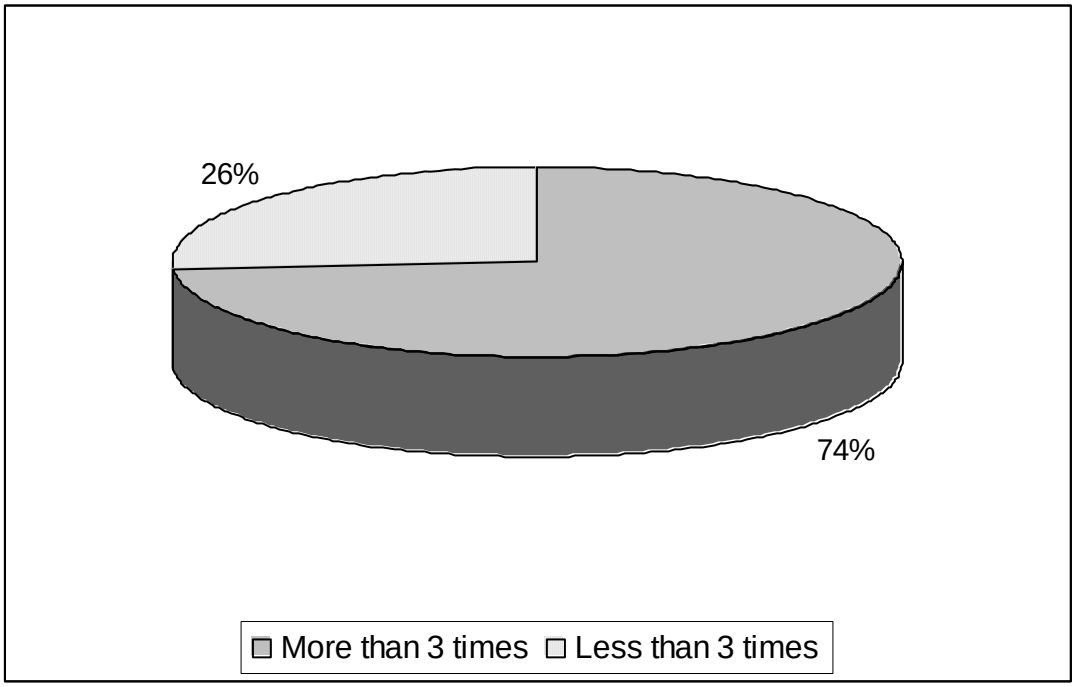

TABLE – 6

PREMARITAL / EXTRAMARITAL CONTACTS

AMONG MARRIED INFERTILE WOMEN (n-100)

Contacts	Total no.	Percentage %
Extra marital contact	Nil	-
Pre marital contact	Nil	-
Extra marital contact + pre marital contact	-	-

When married infertile women were interviewed for the study none gave a history of extra marital or premarital contact showing that all the women in the study are monogamous.

TABLE – 7

PAST HISTORY OF SEXUALLY TRANSMITTED DISEASES (STD) IN THE STUDY GROUP

Past history of STD	Total no.	Percentage %
Present	Nil	-
Absent	100	100%

None of the 100 infertile women give a past history of documented STD or treatment for the same.

TABLE – 8

BAD OBSTETRIC HISTORY (BOH)

Bad Ostetric	Total no.	Percentage %
Spontaneous abortion	11	11%
Still born	1	1%
Neonatal death	Nil	-

Spontaneous abortion and still birth	1	1%

Bad obstetric history was found in 13 patients out of 100 infertile women screened in the study. Majority had spontaneous abortion 11% followed by still birth (1%). One woman had a spontaneous abortion and still birth.

BAD OBSTETRIC HISTORY (BOH)

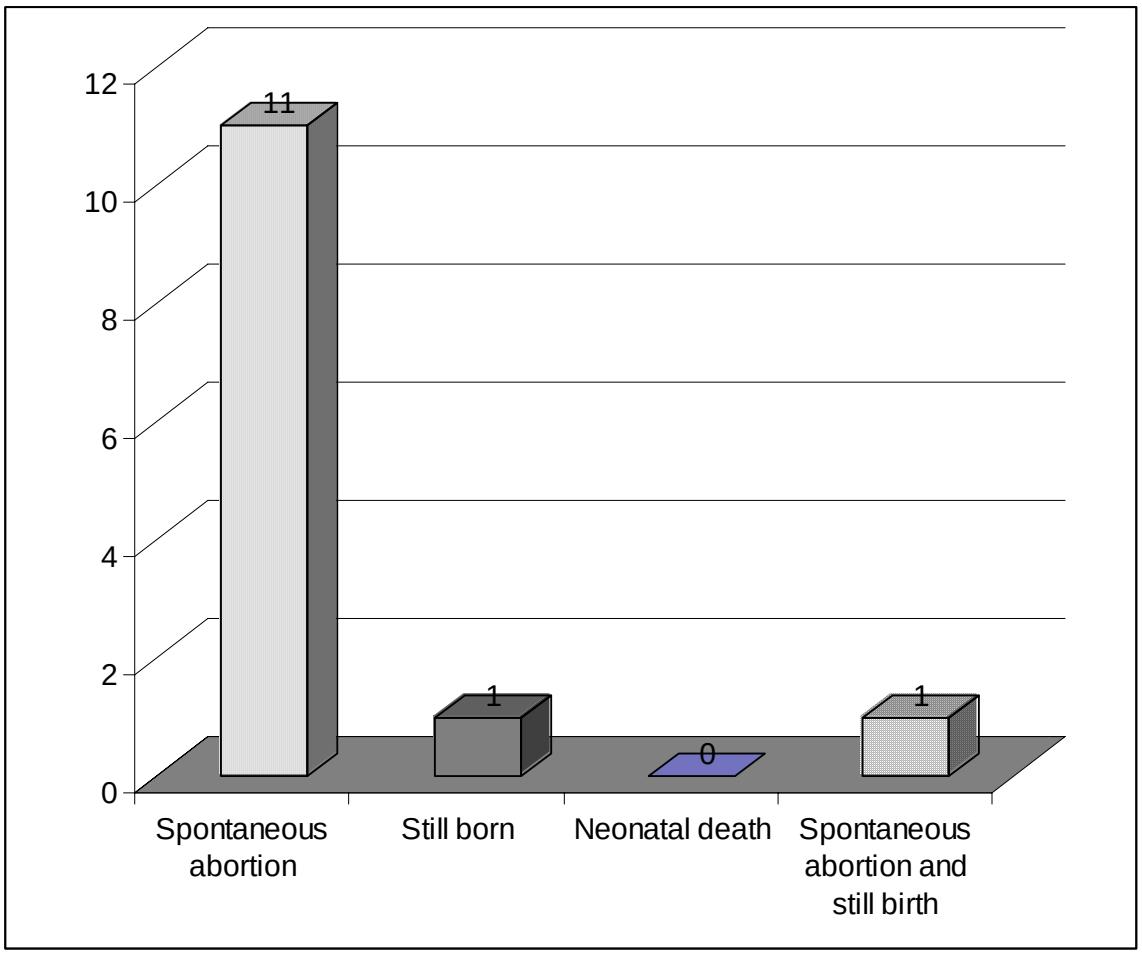

TABLE – 9

CLINICAL SIGNS IN THE STUDY GROUP

OF INFERTILE WOMEN (n-100)

Clinical signs	Total no.	Percentage %
Cervical erosion	36	36%
Soddening of vulva	2	2%
Excoriation of vulva	Nil	Nil
Cervical motion tenderness	3	3%
Intertrigo groin	Nil	Nil
Cervical hypertrophy	30	30%
Fornix tenderness	5	5%
Bilateral inguinal lymphadenopathy	Nil	Nil

Cervical erosion was the most common clinical sign seen in 36% of infertile women. Cervical hypertrophy was the next most common sign seen in 30% of infertile women, followed by tenderness in the fornix.

CLINICAL SIGNS IN THE STUDY GROUP OF INFERTILE WOMEN

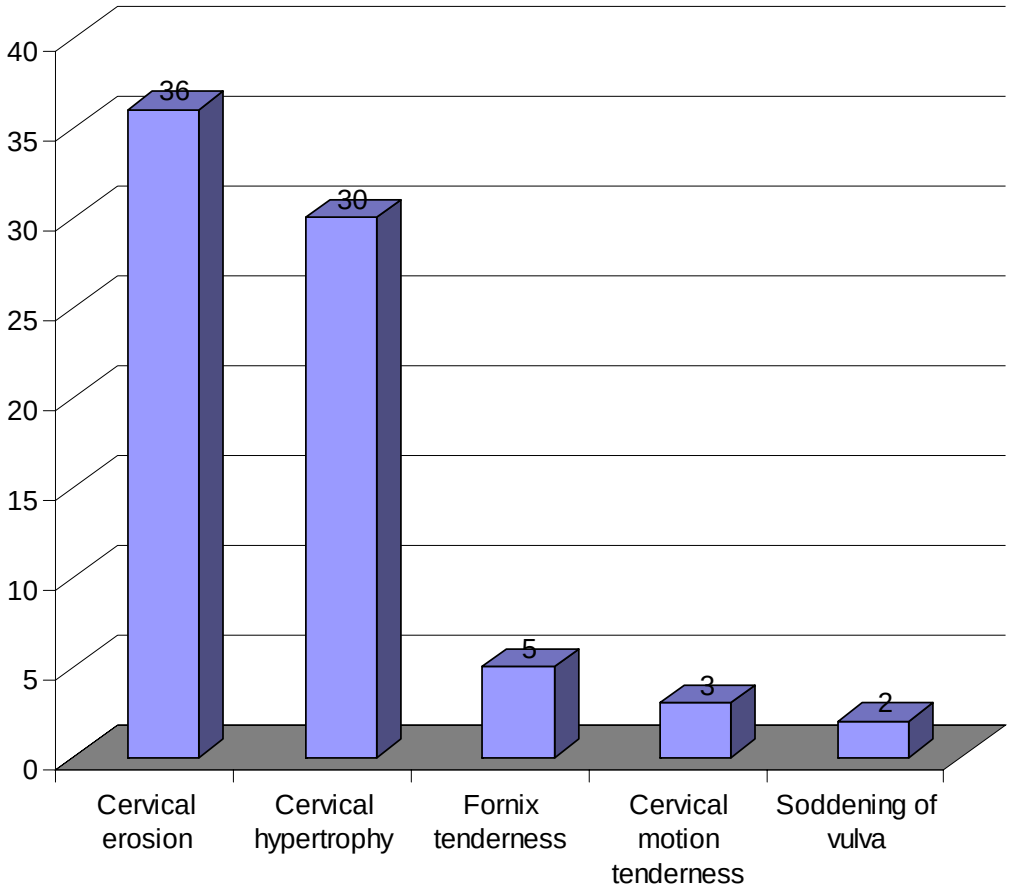
40
35
30
25
20
15
10
5
0
36
30
5
3
2
Cervical erosion
Cervical hypertrophy
Fornix tenderness
Cervical motion tenderness
Soddening of vulva

TABLE – 10

NATURE OF GENITAL DISCHARGE AMONG

THE STUDY GROUP (n-100)

Nature of Discharge	Total no.	Percentage %
Mucopurulent	12	12%
Mucoid	23	23%
Curdy white	3	3%
Frothy	1	1%
Associated foul smelling	2	2%
Associated itching	4	4%

Majority of infertile women had mucoid discharge 23% followed by a mucopurulent discharge 12% curdy white 3% and frothy 1%. Out of the 39 patients who had a genital discharge, the discharge was foul smelling in 2% and 4% of patients had associated itching with discharge. Only 8% of study group complained of genital discharge as a symptom. But on examination 39% of the patients had genital discharge.

CLINICAL SIGNS IN THE STUDY GROUP OF INFERTILE WOMEN

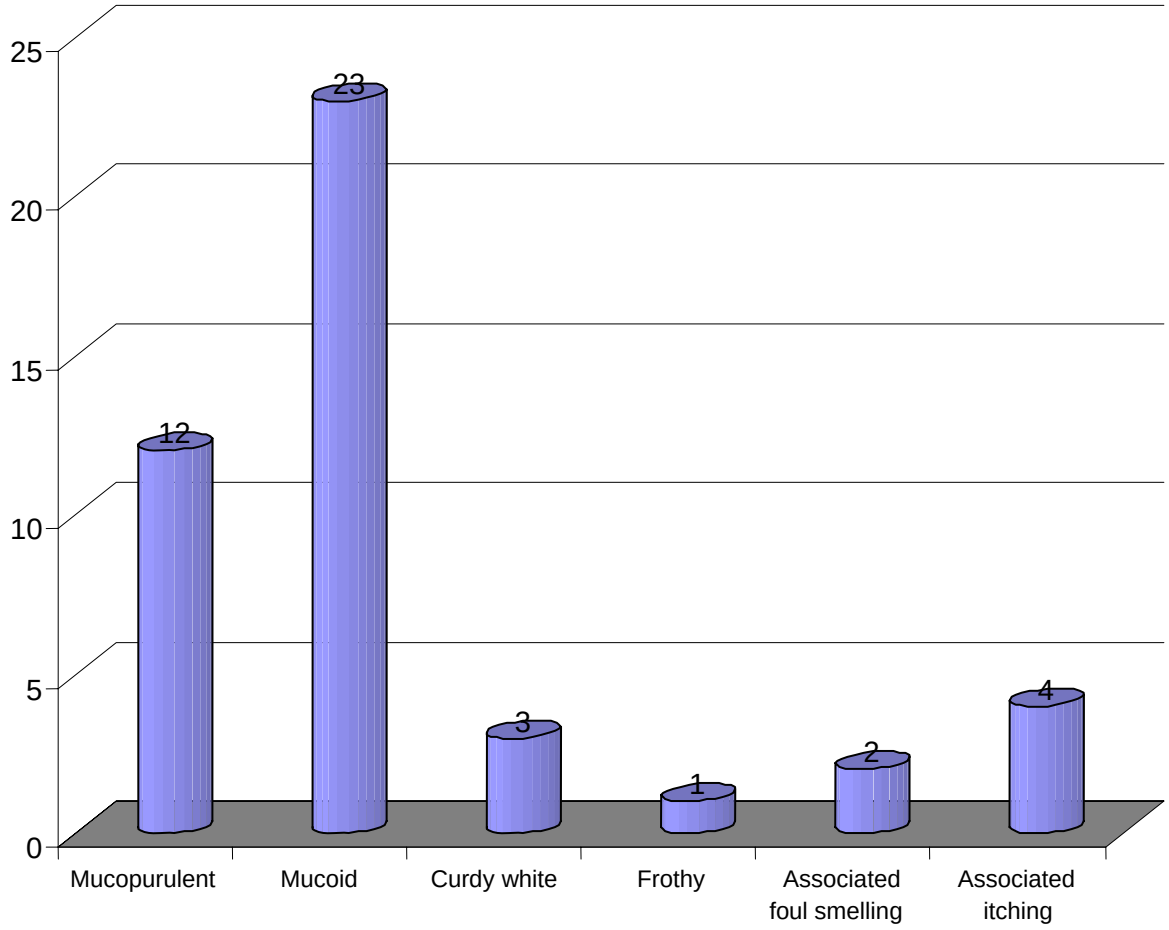

TABLE – 11

RESULTS OF INVESTIGATION IN THE STUDY GROUP OF INFERTILE WOMEN (n-100)

Investigation	Positive results Total No.	Percentage %
Culture for candida	7	7%
Gram Stain for candida	5	5%
KOH mount for candida	4	4%
Wet film for trichomonas vaginalis	10	10%
Gram stain for clue cells	2	2%
Endocervical culture for gonococcus	Nil	Nil
Gram stain for gonococcus	Nil	Nil
Chlamydia antigen detection test	26	26%
Chlamydia IgM antibody ELISA test	20	20%
VDRL	Nil	Nil

Out of the 100 infertile women endocervical smear was positive for Chlamydia antigen in 26% of patients. ELISA test for IgM antibody was positive in 20% of patients making it the most common infection.

Wet film for trichomonas was positive in 10% of patients making it the second most common infection closely followed by candida. 7% of patients showed culture of candida species on Sabouraurd's dextrose agar medium. Candida albicans was the most common isolated species. Bacterial vaginosis was diagnosed in 2% of patients.

Endocervical culture for gonococcus and VDRL test for syphilis was negative in all patients showing that these infections are declining.

RESULTS OF INVESTIGATION IN THE STUDY GROUP OF INFERTILE WOMEN

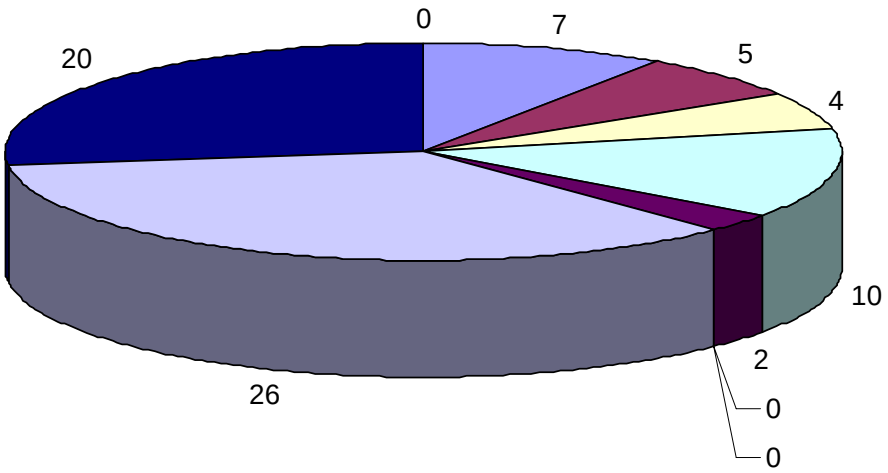

TABLE – 12

CONCOMITANT INFECTIONS IN STUDY GROUP OF INFERTILE WOMEN

Infections	Total no.	Percentage %
Trichomonas vaginalis+ chlamydia	4	4%
Candidiasis+Chlamydia cervicitis	4	4%
Chlamydia	1	1%
PID + Trichomonas vaginalis	2	2%

Concomitant infections with Chlamydia was found in 8% of patients, half was along with trichomonas and the other half with candida.

Six patients fulfilled the criteria for diagnosis of PID in this study. Four of them had concomitant infection two with Trichomonas vaginalis, one with Chlamydia and one patient had both trichomonas & chlamdia along with PID.

6. DISCUSSION

In this study, majority of infertile women were in the age group of 20-24 years followed by 25-29 years. A significant number of infertile women were below 19 years of age. Due to early initiation of sexual activity they are more prone for STD.

Majority of infertile women belonged to the lower socio economic status. Low socio economic status often coexists with poor nutritional status and poor personal hygiene of women that in turn affects the course of the disease.

Majority of the infertile women in this study were married for less than 5 years. The patients in this study had visited the infertility clinic with chief complaint of being anxious to conceive. The most common presenting complaint other than infertility was various menstrual irregularities. Very few had complaints like discharge and itching relating to the genitourinary system.

However on clinical examination and completion of investigations it was seen that 45% of infertile women were suffering from infections. This shows that nearly half the infertile women with infections were asymptomatic. Chlamydia was the most common infection presenting without symptoms. 14 patients out of 26 patients with chalmydia had no symptoms i.e. 53.8% were asymptomatic. The

significance of this is that infertile women may not be aware of the silent clinical states of Chlamydia. This may lead to delay in detection, so progression of the disease leading to complications is common.

The case of Chlamydia associated with symptoms were coexistent with other infections like trichomonas, candida. Only two cases of Chlamydia, not associated with other infections presented with symptoms. One patient had complaint of burning micturition but was not associated with Chlamydia. Early diagnosis by routine screening for STD will greatly help in detection in the initial stages so that effective intervention can be done.

All the women in this study denied history of premarital or extramarital contact showing that all had monogamous relationship. Majority were sexually active. This stresses the fact that innocent women were infected by their promiscuous husbands and were exposed to high risk of acquiring STD resulting in morbidity and mortality.

Bad obstetric history was noted in a significant proportion of infertile women-13%. Among these one woman had trichomonas vaginals infection, another had candidiasis and the third had PID but the majority had no associated infection.

In the study group cervical erosion, cervical hypertrophy and fornix tenderness were the important clinical signs noted. Erosion of the cervix was seen in 36% of women. Erosion or cervical ectopy enhances the entry of a variety of pathogenic agents (eg HPV, HIV, HSV, Trichomonas, chlamydia etc). These women are prone for STD.

In this study mucoid vaginal discharge was commonly seen in 23% of patients which usually does not signify any pathology. Next common was mucopurulent discharge in 12% of patients. Patients with trichomonas vaginalis had predominatly mucopurulent discharge and the typical frothy discharge of trichomonas was seen in only one patient. The usual description of discharge in vulvovaginal candidiasis is curdy white and adherent. In this study only 3% of the infertile women had the above said clinical sign. Majority of these patients had no symptoms and the discharge was noted on routine speculum examination, a few complained of itching in the genitalia. Two patients had bacterial vaginosis and their genital discharge was mucoid in nature.

The prevalence of Chlamydia was the highest 26% in this study compared to other infections. This is comparable to the worldwide prevalence of 24.1%-27%. The prevalence of trichomonas vaginalis in this study population was 10%. There is very little information on the world wide prevalence of trichomonas. The prevalence of genital candida is 7% in this study. The world wide prevalence is

5%-15%. More than half the patients with candidiasis had other associated STDs. Prevalence of bacterial vaginosis in this study was only 2%. Prevalences between 4.9% to 36% have been reported from European and American studies. Prevalence of PID was 6% in this study. The prevalence of PID is 17% -40% of all gynaecological admissions in South East Asia. None of the patients harboured gonococcal infection showing that the prevalence is declining. Gonorrhea rates in the United States declined 56% between 1984 & 1994. One study showed the prevalence rate of gonococcus in New Delhi is 12.2%. None of the patients had syphilis infection. The world wide prevalence of syphilis is 5 per 100,000 but in developing countries it is still between 2.7% - 26.6%. Oxford clinical trials – 2005 Manhatten study showed that prevalence of Chlamydia infections among subfertile women found to be 1.7 to 20%.

Concomitant infections were present in this study. Most infection coexisted with Chlamydia. 5 patients with trichomonas (i.e.50%) and 4 patients with candida (i.e.57.1%) had concomitant infection with Chlamydia. Patients with Chlamydia presenting with symptoms were more likely to have yeast 24% or trichomonas infection 20% coexisting. (Hilton et al., 1974 STD clinic in UK). The above patients would have been missed if treatment of vaginal organisms resolved the symptoms. Individuals with gonorrhoea are at increased risk (approximately 40%) for a chlamydial infection, although the reverse is not true. Latent chlamydial infections are reactivated in the presence of gonorrhoea.

7. CONCLUSION

This study revealed that majority of infertile women were found to be asymptomatic as regards genitourinary symptoms even though they harboured infections. The study also revealed the high prevalence of Chlamydia. The prevalence of gonococcus and sphyllis is declining.

The important risk factor for sexually transmitted diseases noticed in this study was promiscuity among husbands of infertile women. Health education regarding transmission of sexually transmitted diseases (STDs), safer sex and counseling should be made available to them. Prompt treatment of infected persons and their partner by early detection will prevent further disease transmission. It will also minimise severity of long term sequelae. Hence systematic screening of sexually transmitted infection in infertile women combined with adequate treatment and follow up will reduce the risk of adverse consequences and improve the fertility.

STD’s often coexist and a search for them should be instituted in every patient. Routine screening in all infertile women for sexually transmitted infection should be included in infertility clinics. Effective treatment services should be made widely available for those who are found to be infected.

To conclude, there is an urgent need to mount effective, rational and plausible intervention programmes to combat STD pandemic, making optimum use of the existing health social welfare services.

MASTER CHART

Name	Age	S.E. Status	Duration of M.L Years	Presenting Compliants			Type of Discharge	BOH	Clinical Signs		Result of
				IMC	V.D	L.A.P.			Cervix Unhealth	Fornix tenderness	
irami	33	IV	2	+	-	-	-	-	+	-	Chlam
gavani	25	IV	3	-	-	-	-	-	-	-	-
itra	30	IV	2 ½	-	-	-	-	-	-	-	-
ttammal	30	IV	2	+	-	-	-	-	-	-	Chlam
staldevi	30	IV	1 ½	-	-	-	-	-	-	-	-
hima	30	III	4	+	-	-	-	-	-	-	-
geswari	27	IV	10	+	-	-	-	-	-	-	-
mathi	29	V	2	-	+	-	Frothy	-	+	-	TV
eela	28	IV	9	+	+	-	Mucopurulent	-	-	-	Chlam
ochana	21	IV	5	-	-	-	-	-	+	-	-
eralakshmi	30	IV	7	-	-	-	-	-	-	-	-
kshmi	30	V	8	-	-	-	-	-	-	-	-
dhika	27	III	6	+	-	-	-	-	-	-	-
thili	23	IV	6	+	-	-	-	-	-	-	-
amani	22	IV	3	-	+	-	-	-	-	-	Candia+C
thi	24	IV	3	+	-	-	-	-	-	-	-
itra	24	V	5	+	-	-	-	-	+	-	-
ammal	23	V	5	-	-	-	-	-	+	-	-
ira	23	V	2	-	+	-	Mucopurulent	-	+	-	Chlam
galakshmi	20	V	10	-	-	-	-	-	+	-	-
ikala	33	IV	4	-	+	-	Curdy	-	+	-	Cand
athi	28	23	IV	2	-	-	-	-	+	-	-
myaiave	23	24	IV	3	-	-	-	-	+	-	Chlam
llithy	38	IV	4	+	-	-	-	-	-	-	-
hya	20	IV	3	+	-	-	Mucoid	-	+	-	-
nodhini	26	IV	3	-	+	+	Mucopurulent	-	+	+	TV+Chl
laivani	38	V	8	-	+	+	Mucopurulent	-	+	-	Chlamyd
halakshmi	25	IV	4	-	-	-	Mucopurulent	-	+	-	TV
aswathi	29	V	10	-	+	-	Mucoid	-	-	-	B.
rya	24	29	III	4	-	-	-	-	-	-	-
sodha	27	IV	13	+	-	-	-	-	-	-	-
vi	20	V	2	+	-	-	-	-	-	-	-

vi	27	V	9	+	-	-	-	-	-	-	-
ngai	23	IV	10	-	+	+	Mucopurulent	-	+	-	TV+
rya	24	V	2	+	-	-	Mucoid	-	-	-	Chlam
armila	24	V	2 ½	+	-	-	-	+	-	-	Cand
analaxmi	22	IV	3	+	-	-	-	-	+	-	-
vi	22	V	5	-	+	-	Curdy	-	-	-	Candida C
hi	26	IV	8	+	-	-	-	-	+	-	-
amin	25	V	5	-	-	-	-	-	-	-	-
njula	24	V	2	+	+	+	Mucoid	-	+	+	TV +
mala	21	III	1 ½	-	+	-	-	+	+	-	-
abana	22	IV	4	-	+	-	-	-	+	-	-
lpana	21	V	1 ½	+	-	-	-	+	+	-	-
si	25	V	1 ½	-	+	-	Mucopurulent	-	+	-	TV+Chl
shpalatha	24	II	2	+	-	-	-	-	-	-	-
itha	28	IV	6	+	+	-	Mucopurulent	+	+	-	TV
mpoornam	25	IV	9	+	+	+	Curdy	-	+	-	Cand
tteswari	24	IV	2 ½	-	-	-	-	-	-	-	Chlam
bathy	22	IV	5	-	-	-	-	-	-	-	-
enalagi	32	V	2 ½	+	-	-	-	-	-	-	-
la	30	IV	11	-	-	-	-	-	-	-	-
samma	25	V	8	-	-	-	-	+	-	-	-
ppama	23	V	3	-	-	-	-	-	+	-	-
erin	28	IV	10	-	+	-	Mucoid	+	+	+	PI
ageetha	25	V	4	-	-	-	-	-	-	-	-
vagami	20	V	5	-	-	-	-	+	-	-	-
usuya	23	IV	3	+	-	-	Mucoid	+	+	-	-
anthi	30	IV	8	+	+	+	Mucoid	-	+	+	PI
sheela	23	IV	3	+	-	-	-	-	-	-	-
ma	24	IV	4	-	-	-	-	+	+	-	-
na	21	V	1 ½	-	-	-	Mucoid	-	+	-	Chlam
aki	26	V	5	+	-	-	Mucoid	-	+	-	Chalm
smin	19	V	2	+	-	-	-	-	-	-	Chalm
amelu	25	V	5	-	-	-	Mucoid	-	-	-	-
mil Selvi	23	V	5	-	-	-	Mucoid	-	-	-	-
kshmi	25	IV	3	-	+	-	Mucoid	-	-	-	BV
vindamma	26	V	8	+	-	-	Mucoid	-	+	-	Chlam
enmozhi	27	V	6	+	-	-	-	-	+	-	-

vi	23	V	4	-	+	-	Mucopurulent	-	+	-	TV+Chl
udha	23	IV	2	-	-	-	Mucoid	-	-	-	-
ha	26	IV	3	-	-	-	Mucoid	-	+	-	Chlam
njula	25	V	3 ½	-	+	+	Mucopurulent	-	+	+	Chlam
ira	21	IV	5	-	-	-	Mucoid	-	+	-	-
agami	30	IV	12	-	-	-	Mucoid	+	+	-	-
la	19	V	1 ½	-	+	-	Mucopurulent	-	+	-	TV+Cha
mala	22	IV	3 ½	-	-	-	-	-	-	-	-
amundeswari	22	IV	2	-	-	-	Mucoid	+	-	-	-
itra	20	V	4	-	-	-	-	-	+	-	-
rpagam	22	V	3	-	-	-	-	-	-	-	-
lpana	25	IV	3	-	+	-	-	+	+	-	-
a	25	IV	5	+	-	-	-	-	-	-	-
ha	24	V	3 ½	+	+	-	Curdy	-	+	-	Candida+ C
ni	25	V	5	-	-	-	-	-	-	-	-
dhika	19	V	1 ½	-	-	-	-	-	-	-	-
agami	27	V	5	-	-	-	Mucoid	-	-	-	-
wdamani	20	V	4	-	-	-	-	+	-	-	-
ulu	20	V	3	-	-	-	Mucoid	-	-	-	Chlam
ya	21	V	5	+	-	-	-	-	+	-	-
a	23	V	4	+	-	-	-	-	+	-	-
enila	24	V	5	-	-	-	-	-	-	-	-
navathi	28	V	5	-	-	-	-	-	-	-	-
anthi	34	V	13	-	+	-	Mucopurulent	-	+	-	Candida+C
amala	18	V	2	-	-	-	Mucoid	-	-	-	Chlam
dona	30	IV	2	-	+	-	Mucoid	-	+	-	-
lma	22	IV	8	+	-	-	-	-	-	-	-
va	21	V	2	+	-	-	-	-	-	-	-
vi	22	V	1 ½	-	-	-	-	-	-	-	-
nalakshmi	22	IV	2	+	-	-	Mucoid	-	-	-	Chalm
mala	23	IV	3	-	+	-	Mucoid	-	+	-	Chalm

ABBREVIATIONS

IMC	-	Irregular Menstrual Cycles	S.E.	-	Socio Economic Status
PID	-	Pelvi Inflammatory Disease			
VD	-	Vaginal Discharge	BOH	-	Bad Obstetric History
L.A.P	-	Lower Abdominal Pain	TV	-	Trichomonas Vaginalis

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